EX03-089C-US patentin.txt
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<120>   MAPKs AS MODIFIERS OF THE RAC, AXIN, AND BETA-CATENIN PATHWAYS
         AND METHODS OF USE

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ctttgatgaa agcactgcta ttaaagtatg cattgatcaa tcagcagact ctgaaggaga    4380
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cagagattaa atgagtattc agttttattt ttagtaaaga ttaaatccaa aactttactt    5160

ttaatgtagc acagaatagt tttaatgaga aatgcagctt tatgtataaa attaactata    5220

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Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
            35                  40                  45


Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu
        50                  55                  60


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65                  70                  75                  80
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Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly
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Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
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Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu
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Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu
130   135   140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
145   150   155   160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
        165   170   175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
        180   185   190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala
        195   200   205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile
        210   215   220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
225   230   235   240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys
        245   250   255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys
        260   265   270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe
        275   280   285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
        290   295   300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu
305   310   315   320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Glu Asn Asp Ser Gly

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg
            340   345   350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu
        355   360   365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys
    370   375   380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu
385   390   395   400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg
            405   410   415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg
    420   425   430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg
    435   440   445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu
    450   455   460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu
465   470   475   480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met
            485   490   495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser
            500   505   510

Arg Leu Asn Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn
    515   520   525

Arg Ile Ser Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile
    530   535   540

Ser Gly Val Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp
545   550   555   560

Pro Gln Ile Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu
            565   570   575

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Thr Ala Ser Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly
            580             585             590

Phe Gln Glu Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg
        595             600             605

Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile
    610             615             620

Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro
625             630             635             640

Pro Lys Val Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg
            645             650             655

Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser
            660             665             670

Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile
        675             680             685

Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser
    690             695             700

Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly
705             710             715             720

Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys
            725             730             735

Ser Glu Gly Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro
            740             745             750

Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Ser Tyr Lys
            755             760             765

Lys Ala Ile Asp Glu Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu
    770             775             780

Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr
785             790             795             800

Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Asp
            805             810             815

Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro
            820             825             830
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Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val
        835             840             845

Gly Met Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe
    850             855             860

Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser
865             870             875             880

Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly
            885             890             895

His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly
            900             905             910

Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met
        915             920             925

Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe
    930             935             940

Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu
945             950             955             960

Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu
            965             970             975

Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser
            980             985             990

Val Val Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro
        995             1000            1005

Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys
    1010            1015            1020

Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Asn Gly
    1025            1030            1035

Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Asn Leu
    1040            1045            1050

Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu
    1055            1060            1065

Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn Lys Leu Arg Val
    1070            1075            1080
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Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His Asn Asp Pro
    1085   1090   1095

Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp Leu Glu
    1100   1105   1110

Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe
    1115   1120   1125

Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala
    1130   1135   1140

Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp
    1145   1150   1155

Leu Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly
    1160   1165   1170

Gln Arg Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val
    1175   1180   1185

Ile Asp Val Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser
    1190   1195   1200

His Ile Gln Gly Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro
    1205   1210   1215

Lys Thr Asp Gly Met Glu Met Leu Val Cys Tyr Glu Asp Glu Gly
    1220   1225   1230

Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu
    1235   1240   1245

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn
    1250   1255   1260

Gln Ile Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val
    1265   1270   1275

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln
    1280   1285   1290

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala
    1295   1300   1305

Ser Val Arg Ser Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu

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Ser Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Val Val Gly
            20   25   30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
        35   40   45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu Glu
    50   55   60

Glu Ile Lys Leu Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg
65   70   75   80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly
                85   90   95

His Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
                100   105   110

Ile Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Asp
            115   120   125

Trp Ile Ala Tyr Ile Ser Arg Glu Ile Leu Arg Gly Leu Ala His Leu
        130   135   140

His Ile His His Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
145   150   155   160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
                165   170   175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
                180   185   190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala

                195   200   205

Thr Tyr Asp Tyr Arg Ser Asp Leu Trp Ser Cys Gly Ile Thr Ala Ile
    210   215   220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
225   230   235   240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys
            245   250   255

Lys Trp Ser Lys Lys Phe Phe Ser Phe Ile Glu Gly Cys Leu Val Lys
            260   265   270

Asn Tyr Met Gln Arg Pro Ser Thr Glu Gln Leu Leu Lys His Pro Phe
        275   280   285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
    290   295   300

His Ile Asp Arg Thr Arg Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu
305   310   315   320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Val Pro Glu Gln
            325   330   335

Glu Gly Glu Pro Ser Ser Ile Val Asn Val Pro Gly Glu Ser Thr Leu
            340   345   350

Arg Arg Asp Phe Leu Arg Leu Gln Gln Glu Asn Lys Glu Arg Ser Glu
        355   360   365

Ala Leu Arg Arg Gln Gln Leu Leu Gln Glu Gln Leu Arg Glu Gln
    370   375   380

Glu Glu Tyr Lys Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu
385   390   395   400

Gln Gln Lys Glu Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu
            405   410   415

Arg Glu Ala Arg Arg Gln Gln Glu Arg Glu Gln Arg Arg Arg Glu Gln
        420   425   430

Glu Glu Lys Arg Arg Leu Glu Glu Leu Glu Arg Arg Arg Lys Glu Glu
    435   440   445

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Glu Glu Arg Arg Arg Ala Glu Glu Glu Lys Arg Arg Val Glu Arg Glu
450   455   460

Gln Glu Tyr Ile Arg Arg Gln Leu Glu Glu Glu Gln Arg His Leu Glu
465   470   475   480

Val Leu Gln Gln Gln Leu Leu Gln Glu Gln Ala Met Leu Leu His Asp
                485   490   495

His Arg Arg Pro His Pro Gln His Ser Gln Gln Pro Pro Pro Pro Gln
            500   505   510

Gln Glu Arg Ser Lys Pro Ser Phe His Ala Pro Glu Pro Lys Ala His
        515   520   525

Tyr Glu Pro Ala Asp Arg Ala Arg Glu Val Pro Val Arg Thr Thr Ser
530   535   540

Arg Ser Pro Val Leu Ser Arg Arg Asp Ser Pro Leu Gln Gly Ser Gly
545   550   555   560

Gln Gln Asn Ser Gln Ala Gly Gln Arg Asn Ser Thr Ser Ser Ile Glu
                565   570   575

Pro Arg Leu Leu Trp Glu Arg Val Glu Lys Leu Val Pro Arg Pro Gly
            580   585   590

Ser Gly Ser Ser Ser Gly Ser Ser Asn Ser Gly Ser Gln Pro Gly Ser
        595   600   605

His Pro Gly Ser Gln Ser Gly Ser Gly Glu Arg Phe Arg Val Arg Ser
    610   615   620

Ser Ser Lys Ser Glu Gly Ser Pro Ser Gln Arg Leu Glu Asn Ala Val
625   630   635   640

Lys Lys Pro Glu Asp Lys Lys Glu Val Phe Arg Pro Leu Lys Pro Ala
                645   650   655

Gly Glu Val Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Ala Val Glu
            660   665   670

Asp Val Arg Pro Pro His Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu
        675   680   685

Glu Ser Gly Thr Thr Asp Glu Glu Asp Asp Val Glu Gln Glu Gly
    690   695   700

Ala Asp Glu Ser Thr Ser Gly Pro Glu Asp Thr Arg Ala Ala Ser Ser
705   710   715   720

Leu Asn Leu Ser Asn Gly Glu Thr Glu Ser Val Lys Thr Met Ile Val
                 725   730   735

His Asp Asp Val Glu Ser Glu Pro Ala Met Thr Pro Ser Lys Glu Gly
             740   745   750

Thr Leu Ile Val Arg Gln Thr Gln Ser Ala Ser Ser Thr Leu Gln Lys
         755   760   765

His Lys Ser Ser Ser Ser Phe Thr Pro Phe Ile Asp Pro Arg Leu Leu
     770   775   780

Gln Ile Ser Pro Ser Ser Gly Thr Thr Val Thr Ser Val Val Gly Phe
785   790   795   800

Ser Cys Asp Gly Met Arg Pro Glu Ala Ile Arg Gln Asp Pro Thr Arg
             805   810   815

Lys Gly Ser Val Val Asn Val Asn Pro Thr Asn Thr Arg Pro Gln Ser
             820   825   830

Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile
         835   840   845

Leu Cys Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Ser
     850   855   860

Gly Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Pro Leu
865   870   875   880

Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn
             885   890   895

Val Leu Val Thr Ile Ser Gly Lys Lys Asp Lys Leu Arg Val Tyr Tyr
             900   905   910

Leu Ser Trp Leu Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu
     915   920   925

Lys Lys Gln Gly Trp Thr Thr Val Gly Asp Leu Glu Gly Cys Val His
     930   935   940

Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu
945   950   955   960

Lys Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys
         965   970   975

Phe Met Ala Phe Lys Ser Phe Gly Glu Leu Val His Lys Pro Leu Leu
         980   985   990

Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Tyr Gly
         995   1000   1005

Ser Cys Ala Gly Phe His Ala Val Asp Val Asp Ser Gly Ser Val
   1010   1015   1020

Tyr Asp Ile Tyr Leu Pro Thr His Val Arg Lys Asn Pro His Ser
   1025   1030   1035

Met Ile Gln Cys Ser Ile Lys Pro His Ala Ile Ile Ile Leu Pro
   1040   1045   1050

Asn Thr Asp Gly Met Glu Leu Leu Val Cys Tyr Glu Asp Glu Gly
   1055   1060   1065

Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu
   1070   1075   1080

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile Arg Ser Asn
   1085   1090   1095

Gln Thr Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val
   1100   1105   1110

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln
   1115   1120   1125

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala
   1130   1135   1140

Ser Val Arg Ser Gly Gly Ser Ser Gln Val Tyr Phe Met Thr Leu
   1145   1150   1155

Gly Arg Thr Ser Leu Leu Ser Trp
   1160   1165

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Met Gly Asp Pro Ala Pro Ala Arg Ser Leu Asp Asp Ile Asp Leu Ser
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Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Val Val Gly
            20   25   30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly
        35   40   45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu Glu
    50   55   60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg
65   70   75   80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly
                85   90   95

Asn Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser
            100   105   110

Val Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Ala Leu Lys Glu Asp
        115   120   125

Cys Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ala His Leu
    130   135   140

His Ala His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu
145   150   155   160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala
                165   170   175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro
            180   185   190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala
        195   200   205

Thr Tyr Asp Tyr Arg Ser Asp Ile Trp Ser Leu Gly Ile Thr Ala Ile
    210   215   220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg
225   230   235   240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Arg Leu Lys Ser Lys

Lys Trp Ser Lys Lys Phe Ile Asp Phe Ile Asp Thr Cys Leu Ile Lys
        260   265   270

Thr Tyr Leu Ser Arg Pro Pro Thr Glu Gln Leu Leu Lys Phe Pro Phe
        275   280   285

Ile Arg Asp Gln Pro Thr Glu Arg Gln Val Arg Ile Gln Leu Lys Asp
    290   295   300

His Ile Asp Arg Ser Arg Lys Lys Arg Gly Glu Lys Glu Glu Thr Glu
305   310   315   320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Asp Asp Ser His Gly Glu Glu
            325   330   335

Gly Glu Pro Ser Ser Ile Met Asn Val Pro Gly Glu Ser Thr Leu Arg
            340   345   350

Arg Glu Phe Leu Arg Leu Gln Gln Glu Asn Lys Ser Asn Ser Glu Ala
        355   360   365

Leu Lys Gln Gln Gln Gln Leu Gln Gln Gln Gln Arg Asp Pro Glu
        370   375   380

Ala His Ile Lys His Leu Leu His Gln Arg Gln Arg Ile Glu Glu
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Gln Lys Glu Glu Arg Arg Arg Val Glu Glu Gln Arg Arg Glu Arg
            405   410   415

Glu Gln Arg Lys Leu Gln Glu Lys Glu Gln Gln Arg Arg Leu Glu Asp
            420   425   430

Met Gln Ala Leu Arg Arg Glu Glu Glu Arg Arg Gln Ala Glu Arg Glu
        435   440   445

Gln Glu Tyr Lys Arg Lys Gln Leu Glu Glu Gln Arg Gln Ser Glu Arg
    450   455   460

Leu Gln Arg Gln Leu Gln Gln Glu His Ala Tyr Leu Lys Ser Leu Gln
465   470   475   480

Gln Gln Gln Gln Gln Gln Gln Leu Gln Lys Gln Gln Gln Gln Gln Leu
            485   490   495

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Leu Pro Gly Asp Arg Lys Pro Leu Tyr His Tyr Gly Arg Gly Met Asn
            500   505   510

Pro Ala Asp Lys Pro Ala Trp Ala Arg Glu Val Glu Glu Arg Thr Arg
        515   520   525

Met Asn Lys Gln Gln Asn Ser Pro Leu Ala Lys Ser Lys Pro Gly Ser
        530   535   540

Thr Gly Pro Glu Pro Pro Ile Pro Gln Ala Ser Pro Gly Pro Pro Gly
545   550   555   560

Pro Leu Ser Gln Thr Pro Pro Met Gln Arg Pro Val Glu Pro Gln Glu
                565   570   575

Gly Pro His Lys Ser Leu Val Ala His Arg Val Pro Leu Lys Pro Tyr
            580   585   590

Ala Ala Pro Val Pro Arg Ser Gln Ser Leu Gln Asp Gln Pro Thr Arg
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Asn Leu Ala Ala Phe Pro Ala Ser His Asp Pro Asp Pro Ala Ile Pro
    610   615   620

Ala Pro Thr Ala Thr Pro Ser Ala Arg Gly Ala Val Ile Arg Gln Asn
625   630   635   640

Ser Asp Pro Thr Ser Glu Gly Pro Gly Pro Ser Pro Asn Pro Pro Ala
                645   650   655

Trp Val Arg Pro Asp Asn Glu Ala Pro Pro Lys Val Pro Gln Arg Thr
            660   665   670

Ser Ser Ile Ala Thr Ala Leu Asn Thr Ser Gly Ala Gly Gly Ser Arg
        675   680   685

Pro Ala Gln Ala Val Arg Ala Ser Asn Pro Asp Leu Arg Arg Ser Asp
    690   695   700

Pro Gly Trp Glu Arg Ser Asp Ser Val Leu Pro Ala Ser His Gly His
705   710   715   720

Leu Pro Gln Ala Gly Ser Leu Glu Arg Asn Arg Val Gly Val Ser Ser
            725   730   735

Lys Pro Asp Ser Ser Pro Val Leu Ser Pro Gly Asn Lys Ala Lys Pro
            740   745   750

Asp Asp His Arg Ser Arg Pro Gly Arg Pro Ala Asp Phe Val Leu Leu
        755   760   765

Lys Glu Arg Thr Leu Asp Glu Ala Pro Arg Pro Pro Lys Lys Ala Met
    770   775   780

Asp Tyr Ser Ser Ser Ser Glu Glu Val Glu Ser Ser Glu Asp Asp Glu
785   790   795   800

Glu Glu Gly Glu Gly Gly Pro Ala Glu Gly Ser Arg Asp Thr Pro Gly
            805   810   815

Gly Arg Ser Asp Gly Asp Thr Asp Ser Val Ser Thr Met Val Val His
        820   825   830

Asp Val Glu Glu Ile Thr Gly Thr Gln Pro Pro Tyr Gly Gly Gly Thr
        835   840   845

Met Val Val Gln Arg Thr Pro Glu Glu Glu Arg Asn Leu Leu His Ala
    850   855   860

Asp Ser Asn Gly Tyr Thr Asn Leu Pro Asp Val Val Gln Pro Ser His
865   870   875   880

Ser Pro Thr Glu Asn Ser Lys Gly Gln Ser Pro Pro Ser Lys Asp Gly
            885   890   895

Ser Gly Asp Tyr Gln Ser Arg Gly Leu Val Lys Ala Pro Gly Lys Ser
        900   905   910

Ser Phe Thr Met Phe Val Asp Leu Gly Ile Tyr Gln Pro Gly Gly Ser
    915   920   925

Gly Asp Ser Ile Pro Ile Thr Ala Leu Val Gly Gly Glu Gly Thr Arg
    930   935   940

Leu Asp Gln Leu Gln Tyr Asp Val Arg Lys Gly Ser Val Val Asn Val
945   950   955   960

Asn Pro Thr Asn Thr Arg Ala His Ser Glu Thr Pro Glu Ile Arg Lys
            965   970   975

Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly
        980   985   990

Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg
    995   1000   1005

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Ser Gly Gln Gly Lys Val Tyr Gly Leu Ile Gly Arg Arg Arg Phe
    1010   1015   1020

Gln Gln Met Asp Val Leu Glu Gly Leu Asn Leu Leu Ile Thr Ile
    1025   1030   1035

Ser Gly Lys Arg Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu
    1040   1045   1050

Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln
    1055   1060   1065

Gly Trp Thr Thr Val Gly Asp Met Glu Gly Cys Gly His Tyr Arg
    1070   1075   1080

Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys
    1085   1090   1095

Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys
    1100   1105   1110

Phe Met Ala Phe Lys Ser Phe Ala Asp Leu Pro His Arg Pro Leu
    1115   1120   1125

Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile
    1130   1135   1140

Tyr Gly Ser Ser Ala Gly Phe His Ala Val Asp Val Asp Ser Gly
    1145   1150   1155

Asn Ser Tyr Asp Ile Tyr Ile Pro Val His Ile Gln Ser Gln Ile
    1160   1165   1170

Thr Pro His Ala Ile Ile Phe Leu Pro Asn Thr Asp Gly Met Glu
    1175   1180   1185

Met Leu Leu Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr
    1190   1195   1200

Gly Arg Ile Ile Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro
    1205   1210   1215

Thr Ser Val Ala Tyr Ile Cys Ser Asn Gln Ile Met Gly Trp Gly
    1220   1225   1230

Glu Lys Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp

```
         1235                    1240                    1245
```

```
Gly Val  Phe Met His Lys Arg  Ala Gln Arg Leu Lys  Phe Leu Cys
         1250                    1255                 1260
```

```
Glu Arg  Asn Asp Lys Val Phe  Phe Ala Ser Val Arg  Ser Gly Gly
         1265                    1270                 1275
```

```
Ser Ser  Gln Val Tyr Phe Met  Thr Leu Asn Arg Asn  Cys Ile Met
         1280                    1285                 1290
```

```
Asn Trp
    1295
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<210>  39
<211>  1582
<212>  PRT
<213>  Homo sapiens
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<400>  39
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```
Met Ala Gly Pro Gly Gly Trp Arg Asp Arg Glu Val Thr Asp Leu Gly
1               5                   10                  15
```

```
His Leu Pro Asp Pro Thr Gly Ile Phe Ser Leu Asp Lys Thr Ile Gly
            20                  25                  30
```

```
Leu Gly Thr Tyr Gly Arg Ile Tyr Leu Gly Leu His Glu Lys Thr Gly
        35                  40                  45
```

```
Ala Phe Thr Ala Val Lys Val Met Asn Ala Arg Lys Thr Pro Leu Pro
    50                  55                  60
```

```
Glu Ile Gly Arg Arg Val Arg Val Asn Lys Tyr Gln Lys Ser Val Gly
65                  70                  75                  80
```

```
Trp Arg Tyr Ser Asp Glu Glu Glu Asp Leu Arg Thr Glu Leu Asn Leu
                85                  90                  95
```

```
Leu Arg Lys Tyr Ser Phe His Lys Asn Ile Val Ser Phe Tyr Gly Ala
                100                 105                 110
```

```
Phe Phe Lys Leu Ser Pro Pro Gly Gln Arg His Gln Leu Trp Met Val
            115                 120                 125
```

```
Met Glu Leu Cys Ala Ala Gly Ser Val Thr Asp Val Val Arg Met Thr
    130                 135                 140
```

```
Ser Asn Gln Ser Leu Lys Glu Asp Trp Ile Ala Tyr Ile Cys Arg Glu
```

145   150   155   160

Ile Leu Gln Gly Leu Ala His Leu His Ala His Arg Val Ile His Arg
            165   170   175

Asp Ile Lys Gly Gln Asn Val Leu Leu Thr His Asn Ala Glu Val Lys
            180   185   190

Leu Val Asp Phe Gly Val Ser Ala Gln Val Ser Arg Thr Asn Gly Arg
            195   200   205

Arg Asn Ser Phe Ile Gly Thr Pro Tyr Trp Met Ala Pro Glu Val Ile
    210   215   220

Asp Cys Asp Glu Asp Pro Arg Arg Ser Tyr Asp Tyr Arg Ser Asp Val
225   230   235   240

Trp Ser Val Gly Ile Thr Ala Ile Glu Met Ala Glu Gly Ala Pro Pro
            245   250   255

Leu Cys Asn Leu Gln Pro Leu Glu Ala Leu Phe Val Ile Leu Arg Glu
            260   265   270

Ser Ala Pro Thr Val Lys Ser Ser Gly Trp Ser Arg Lys Phe His Asn
            275   280   285

Phe Met Glu Lys Cys Thr Ile Lys Asn Phe Leu Phe Arg Pro Thr Ser
    290   295   300

Ala Asn Met Leu Gln His Pro Phe Val Arg Asp Ile Lys Asn Glu Arg
305   310   315   320

His Val Val Glu Ser Leu Thr Arg His Leu Thr Gly Ile Ile Lys Lys
            325   330   335

Arg Gln Lys Lys Gly Ile Pro Leu Ile Phe Glu Arg Glu Glu Ala Ile
            340   345   350

Lys Glu Gln Tyr Thr Val Arg Arg Phe Arg Gly Pro Ser Cys Thr His
            355   360   365

Glu Leu Leu Arg Leu Pro Thr Ser Ser Arg Cys Arg Pro Leu Arg Val
    370   375   380

Leu His Gly Glu Pro Ser Gln Pro Arg Trp Leu Pro Asp Arg Glu Glu
385   390   395   400

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```
Pro Gln Val Gln Ala Leu Gln Gln Leu Gln Gly Ala Ala Arg Val Phe
            405             410             415

Met Pro Leu Gln Ala Leu Asp Ser Ala Pro Lys Pro Leu Lys Gly Gln
            420             425             430

Ala Gln Ala Pro Gln Arg Leu Gln Gly Ala Ala Arg Val Phe Met Pro
        435             440             445

Leu Gln Ala Gln Val Lys Ala Lys Ala Ser Lys Pro Leu Gln Met Gln
    450             455             460

Ile Lys Ala Pro Pro Arg Leu Arg Arg Ala Ala Arg Val Leu Met Pro
465             470             475             480

Leu Gln Ala Gln Val Arg Ala Pro Arg Leu Leu Gln Val Gln Ser Gln
            485             490             495

Val Ser Lys Lys Gln Gln Ala Gln Thr Gln Thr Ser Glu Pro Gln Asp
        500             505             510

Leu Asp Gln Val Pro Glu Glu Phe Gln Gly Gln Asp Gln Val Pro Glu
        515             520             525

Gln Gln Arg Gln Gly Gln Ala Pro Glu Gln Gln Gln Arg His Asn Gln
    530             535             540

Val Pro Glu Gln Glu Leu Glu Gln Asn Gln Ala Pro Glu Gln Pro Glu
545             550             555             560

Val Gln Glu Gln Ala Ala Glu Pro Ala Gln Ala Glu Thr Glu Ala Glu
            565             570             575

Glu Pro Glu Ser Leu Arg Val Asn Ala Gln Val Phe Leu Pro Leu Leu
            580             585             590

Ser Gln Asp His His Val Leu Leu Pro Leu His Leu Asp Thr Gln Val
    595             600             605

Leu Ile Pro Val Glu Gly Gln Thr Glu Gly Ser Pro Gln Ala Gln Ala
    610             615             620

Trp Thr Leu Glu Pro Pro Gln Ala Ile Gly Ser Val Gln Ala Leu Ile
625             630             635             640

Glu Gly Leu Ser Arg Asp Leu Leu Arg Ala Pro Asn Ser Asn Asn Ser
            645             650             655
```

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```
Lys Pro Leu Gly Pro Leu Gln Thr Leu Met Glu Asn Leu Ser Ser Asn
        660             665             670

Arg Phe Tyr Ser Gln Pro Glu Gln Ala Arg Glu Lys Lys Ser Lys Val
        675             680             685

Ser Thr Leu Arg Gln Ala Leu Ala Lys Arg Leu Ser Pro Lys Arg Phe
        690             695             700

Arg Ala Lys Ser Ser Trp Arg Pro Glu Lys Leu Glu Leu Ser Asp Leu
705             710             715             720

Glu Ala Arg Arg Gln Arg Arg Gln Arg Arg Trp Glu Asp Ile Phe Asn
                725             730             735

Gln His Glu Glu Glu Leu Arg Gln Val Asp Lys Asp Lys Glu Asp Glu
                740             745             750

Ser Ser Asp Asn Asp Glu Val Phe His Ser Ile Gln Ala Glu Val Gln
        755             760             765

Ile Glu Pro Leu Lys Pro Tyr Ile Ser Asn Pro Lys Lys Ile Glu Val
        770             775             780

Gln Glu Arg Ser Pro Ser Val Pro Asn Asn Gln Asp His Ala His His
785             790             795             800

Val Lys Phe Ser Ser Ser Val Pro Gln Arg Ser Leu Leu Glu Gln Ala
                805             810             815

Gln Lys Pro Ile Asp Ile Arg Gln Arg Ser Ser Gln Asn Arg Gln Asn
                820             825             830

Trp Leu Ala Ala Ser Glu Ser Ser Ser Glu Glu Glu Ser Pro Val Thr
        835             840             845

Gly Arg Arg Ser Gln Ser Ser Pro Pro Tyr Ser Thr Ile Asp Gln Lys
        850             855             860

Leu Leu Val Asp Ile His Val Pro Asp Gly Phe Lys Val Gly Lys Ile
865             870             875             880

Ser Pro Pro Val Tyr Leu Thr Asn Glu Trp Val Gly Tyr Asn Ala Leu
                885             890             895

Ser Glu Ile Phe Arg Asn Asp Trp Leu Thr Pro Ala Pro Val Ile Gln
        900             905             910
```

Pro Pro Glu Glu Asp Gly Asp Tyr Val Glu Leu Tyr Asp Ala Ser Ala
        915   920   925

Asp Thr Asp Gly Asp Asp Asp Asp Glu Ser Asn Asp Thr Phe Glu Asp
    930   935   940

Thr Tyr Asp His Ala Asn Gly Asn Asp Asp Leu Asp Asn Gln Val Asp
945   950   955   960

Gln Ala Asn Asp Val Cys Lys Asp His Asp Asp Asp Asn Asn Lys Phe
            965   970   975

Val Asp Asp Val Asn Asn Asn Tyr Tyr Glu Ala Pro Ser Cys Pro Arg
            980   985   990

Ala Ser Tyr Gly Arg Asp Gly Ser Cys Lys Gln Asp Gly Tyr Asp Gly
        995   1000   1005

Ser Arg Gly Lys Glu Glu Ala Tyr Arg Gly Tyr Gly Ser His Thr
    1010   1015   1020

Ala Asn Arg Ser His Gly Gly Ser Ala Ala Ser Glu Asp Asn Ala
    1025   1030   1035

Ala Ile Gly Asp Gln Glu Glu His Ala Ala Asn Ile Gly Ser Glu
    1040   1045   1050

Arg Arg Gly Ser Glu Gly Asp Gly Gly Lys Gly Val Val Arg Thr
    1055   1060   1065

Ser Glu Glu Ser Gly Ala Leu Gly Leu Asn Gly Glu Glu Asn Cys
    1070   1075   1080

Ser Glu Thr Asp Gly Pro Gly Leu Lys Arg Pro Ala Ser Gln Asp
    1085   1090   1095

Phe Glu Tyr Leu Gln Glu Glu Pro Gly Gly Gly Asn Glu Ala Ser
    1100   1105   1110

Asn Ala Ile Asp Ser Gly Ala Ala Pro Ser Ala Pro Asp His Glu
    1115   1120   1125

Ser Asp Asn Lys Asp Ile Ser Glu Ser Ser Thr Gln Ser Asp Phe
    1130   1135   1140

Ser Ala Asn His Ser Ser Pro Ser Lys Gly Ser Gly Met Ser Ala

```
        1145                    1150                    1155


Asp Ala  Asn Phe Ala Ser Ala  Ile Leu Tyr Ala Gly  Phe Val Glu
    1160                1165                1170


Val Pro  Glu Glu Ser Pro Lys  Gln Pro Ser Glu Val  Asn Val Asn
    1175                1180                1185


Pro Leu  Tyr Val Ser Pro Ala  Cys Lys Lys Pro Leu  Ile His Met
    1190                1195                1200


Tyr Glu  Lys Glu Phe Thr Ser  Glu Ile Cys Cys Gly  Ser Leu Trp
    1205                1210                1215


Gly Val  Asn Leu Leu Leu Gly  Thr Arg Ser Asn Leu  Tyr Leu Met
    1220                1225                1230


Asp Arg  Ser Gly Lys Ala Asp  Ile Thr Lys Leu Ile  Arg Arg Arg
    1235                1240                1245


Pro Phe  Arg Gln Ile Gln Val  Leu Glu Pro Leu Asn  Leu Leu Ile
    1250                1255                1260


Thr Ile  Ser Gly His Lys Asn  Arg Leu Arg Val Tyr  His Leu Thr
    1265                1270                1275


Trp Leu  Arg Asn Lys Ile Leu  Asn Asn Asp Pro Glu  Ser Lys Arg
    1280                1285                1290


Arg Gln  Glu Glu Met Leu Lys  Thr Glu Glu Ala Cys  Lys Ala Ile
    1295                1300                1305


Asp Lys  Leu Thr Gly Cys Glu  His Phe Ser Val Leu  Gln His Glu
    1310                1315                1320


Glu Thr  Thr Tyr Ile Ala Ile  Ala Leu Lys Ser Ser  Ile His Leu
    1325                1330                1335


Tyr Ala  Trp Ala Pro Lys Ser  Phe Asp Glu Ser Thr  Ala Ile Lys
    1340                1345                1350


Val Cys  Ile Asp Gln Ser Ala  Asp Ser Glu Gly Asp  Tyr Met Ser
    1355                1360                1365


Tyr Gln  Ala Tyr Ile Arg Ile  Leu Ala Lys Ile Gln  Ala Ala Asp
    1370                1375                1380
```

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```
Pro Val  Asn Arg Phe Lys Arg  Pro Asp Glu Leu Leu  His Leu Leu
    1385            1390              1395


Lys Leu  Lys Val Phe Pro Thr  Leu Asp His Lys Pro  Val Thr Val
    1400            1405              1410


Asp Leu  Ala Ile Gly Ser Glu  Lys Arg Leu Lys Ile  Phe Phe Ser
    1415            1420              1425


Ser Ala  Asp Gly Tyr His Leu  Ile Asp Ala Glu Ser  Glu Val Met
    1430            1435              1440


Ser Asp  Val Thr Leu Pro Lys  Asn Pro Leu Glu Ile  Ile Ile Pro
    1445            1450              1455


Gln Asn  Ile Ile Ile Leu Pro  Asp Cys Leu Gly Ile  Gly Met Met
    1460            1465              1470


Leu Thr  Phe Asn Ala Glu Ala  Leu Ser Val Glu Ala  Asn Glu Gln
    1475            1480              1485


Leu Phe  Lys Lys Ile Leu Glu  Met Trp Lys Asp Ile  Pro Ser Ser
    1490            1495              1500


Ile Ala  Phe Glu Cys Thr Gln  Arg Thr Thr Gly Trp  Gly Gln Lys
    1505            1510              1515


Ala Ile  Glu Val Arg Ser Leu  Gln Ser Arg Val Leu  Glu Ser Glu
    1520            1525              1530


Leu Lys  Arg Arg Ser Ile Lys  Lys Leu Arg Phe Leu  Cys Thr Arg
    1535            1540              1545


Gly Asp  Lys Leu Phe Phe Thr  Ser Thr Leu Arg Asn  His His Ser
    1550            1555              1560


Arg Val  Tyr Phe Met Thr Leu  Gly Lys Leu Glu Glu  Leu Gln Ser
    1565            1570              1575


Asn Tyr  Asp Val
    1580
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<210>  40
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<212>  PRT
<213>  Homo sapiens

<400>  40
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Met Ser Asp Val Thr Leu Pro Lys Asn Pro Leu Glu Ile Ile Ile Pro
1           5               10              15

Gln Asn Ile Ile Ile Leu Pro Asp Cys Leu Gly Ile Gly Met Met Leu
        20              25              30

Thr Phe Asn Ala Glu Ala Leu Ser Val Glu Ala Asn Glu Gln Leu Phe
        35              40              45

Lys Lys Ile Leu Glu Met Trp Lys Asp Ile Pro Ser Ser Ile Ala Phe
    50              55              60

Glu Cys Thr Gln Arg Thr Thr Gly Trp Gly Gln Lys Ala Ile Glu Val
65              70              75              80

Arg Ser Leu Gln Ser Arg Val Leu Glu Ser Glu Leu Lys Arg Arg Ser
            85              90              95

Ile Lys Lys Leu Arg Phe Leu Cys Thr Arg Gly Asp Lys Leu Phe Phe
        100             105             110

Thr Ser Thr Leu Arg Asn His His Ser Arg Val Tyr Phe Met Thr Leu
        115             120             125

Gly Lys Leu Glu Glu Leu Gln Ser Asn Tyr Asp Val
    130             135             140
```